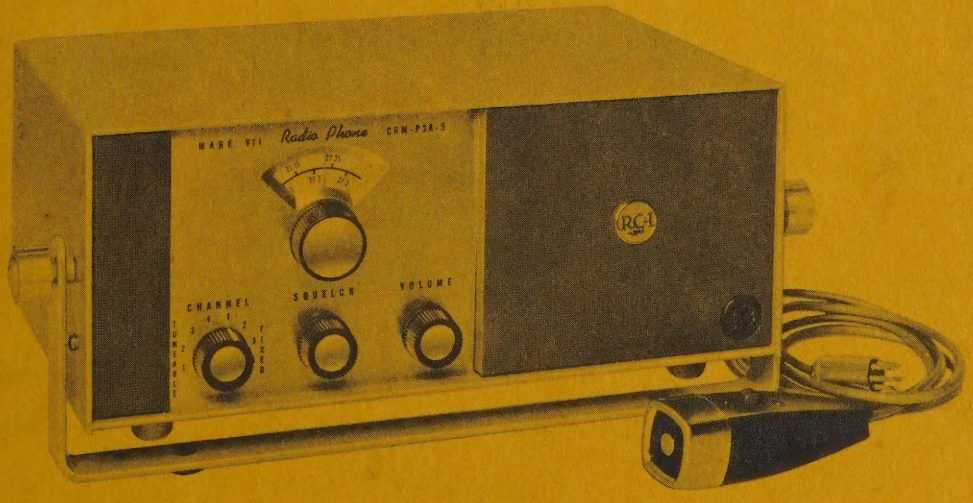
INSTRUCTION BOOK

MARK VII *Radio Phone*

TYPE CRM-P3A-5

27 mc CITIZENS' BAND 2-WAY RADIO



RADIO CORPORATION OF AMERICA

COMMUNICATION PRODUCTS DEPARTMENT

CANONSBURG, PA.

IB-30903-1

PRELIMINARY INSTRUCTIONS

These instructions cover the installation and operation of the RCA Mark VII RADIO-PHONE. To obtain the best possible performance from your new RADIO-PHONE read these instructions thoroughly before you begin installation.

As you unpack the equipment examine it for any apparent damage that might have occurred in shipment. If any damage is found, file a claim with your carrier or dealer immediately. Supply full information promptly in order to expedite your claim.

The Mark VII RADIO-PHONE was carefully tested and inspected before leaving the factory. If this equipment is properly installed and operated in accordance with the instructions given in this booklet, you will be assured of top performance.

The following items are packed with the RADIO-PHONE:

1 — Microphone
1 — Microphone Holder
1 — AC Line Cord
1 — Battery Line Cord
1 — Perforated Strap
2 — Thumb-bolts
2 — Washers
1 — Envelope, containing:
Instruction Book
License Application
Warranty Card

ACCESSORIES

The following accessories are available for use with your new Mark VII RADIO-PHONE:

Ground Plane Antenna MI-555500
Light Duty Ground Plane Antenna MI-555501A
Auto Bumper Mount Antenna MI-555578
Auto Swivel Ball Mounting Antenna MI-555579
Marine Stainless Steel Antenna MI-555580
Coaxial Cable, 50 ft., with connectors attached, for connecting ground plane antenna to RADIO-PHONE MI-555586
Microphone Desk Stand MI-555584
Press-to-Talk Handset MI-555585

MARK VII *Radio Phone*

TYPE CRM-P3A-5

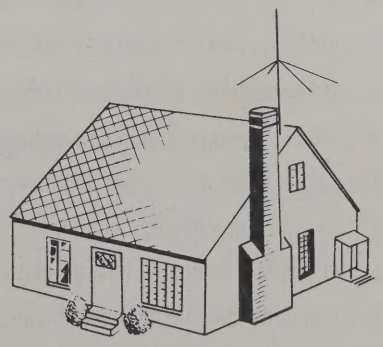
Your new RADIO-PHONE is a precision instrument that will provide you with reliable two-way communication in the 27 megacycle Citizens' Band. This band of frequencies, which includes 23 individual channels, was allocated by the Federal Communications Commission for the use of any citizen of the United States who has a need for short range communication (business or personal) and who has reached the age of eighteen.

The Mark VII RADIO-PHONE has four crystal-controlled transmitting channels and four crystal-controlled receiving channels. One pair* of crystals for transmitting and receiving on one of the allocated frequencies is supplied with the equipment. Additional transmitter and/or receiver crystals can be added at any time. (See page 8 for ordering instructions.) You can also manually tune the receiver to any 27 megacycle citizens' band channel, making it possible to transmit on one channel and receive on a different channel. This enables you to communicate with someone whose transmitter frequency is different from yours, provided of course, he also has a tuneable receiver.

The Mark VII RADIO-PHONE can be operated from ordinary 115 Volt AC house current. In addition, it can be powered by the storage battery in your car, truck, tractor or boat.

Since there are so many places where the RADIO-PHONE can be used, each with a different antenna and antenna mounting requirement, no antenna is supplied with the equipment. Several different antennas are available. Each one is designed to give best performance for a particular type of installation.

FIXED INSTALLATION

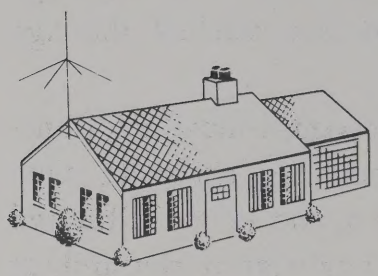


When operating the RADIO-PHONE in your home, office building or any other building, a ground plane antenna may be used. This antenna consists of a vertical whip, approximately nine feet in length, and four similar elements extending horizontally from the base. There are two types available — the light duty model, MI-555501A, and the more rugged

* The Mark VII RADIO-PHONE will be supplied with additional crystals on special order and at additional cost. Specify the desired frequencies and DC battery voltage. The equipment will be factory tuned for the new frequencies.

standard duty model, MI-555500. For best results and maximum range use one of the recommended antennas or other antenna with a low standing wave ratio.

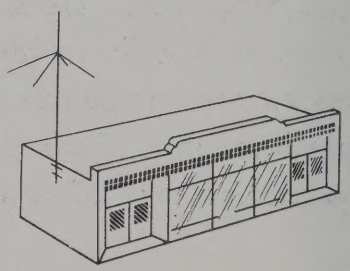
The light duty antenna can be clamped to any round mast up to one inch in diameter. The standard duty type screws onto a 1¼-inch IPS pipe. No mast is supplied with the antenna but one can be readily obtained from your local television service shop or plumbing supply store.



The mast for either antenna can be secured to the building by means of one of the standard television antenna mounting kits. Several types are available at your local television service shop or radio and television parts dealer. With the appropriate mounting kit, the mast can be secured to a chimney, a wall, or the eaves ridge of a peaked roof. Installation instructions are normally supplied with the kit.

To minimize the possibility of damage from lightning, connect a heavy wire (#10 AWG or larger) between the antenna mast and a good ground.

Use either RG-58/U or RG-8/U coaxial cable to connect the antenna to the RADIO-PHONE. For cable runs longer than 75 feet, RG-8/U cable is preferred to minimize the power loss. Each end of the cable must be terminated in a UHF connector, PL-259. If RG-58/U cable is used, a type UG-175/U adapter is also required. See Figure 1 for connector assembly instructions.



If you prefer, a fifty foot long RG-58/U cable with connectors on both ends is available from your dealer. This assembly is identified as part number MI-555586.

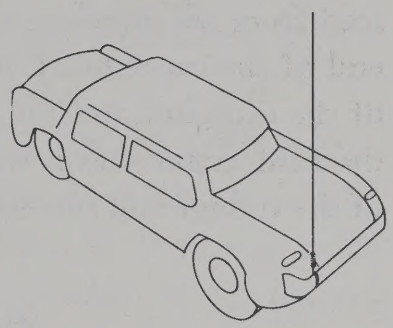
If you need help to install the antenna, look up the local Factory Service Branch of the RCA Service Company in the classified section of your telephone directory under "Television Servicing."

Plug one end of the AC cord into the receptacle on the back of the RADIO-PHONE and the other end into an AC outlet (117 volt, 60 cycle AC only). Mount the microphone holder in a convenient location and plug the microphone cord into the receptacle in the lower right-hand corner of the front panel.

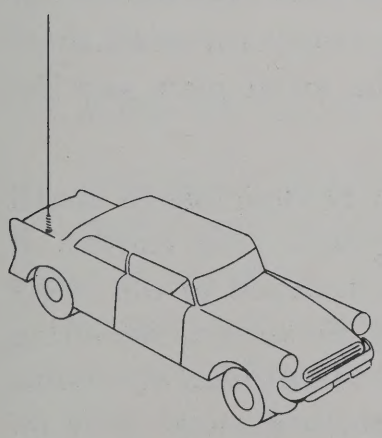
MOBILE INSTALLATION

If you plan to install your new RADIO-PHONE in an automobile, truck, tractor or other vehicle, it will be powered by the storage battery. In most cases the battery voltage is either 6 volts or 12 volts. Make sure that you have the RADIO-PHONE model that is correct for your battery voltage by checking the nameplate on the back of the unit.

There is no one method of installation that is satisfactory for all makes and models of automobiles. In most cases, however, the RADIO-PHONE can be mounted under the dash by means of the carrying handle and the perforated steel strap that is supplied with the equipment. Remove the two rubber bumpers from the handle to provide mounting holes. Cut and bend the perforated strap, to the desired shape, to support the back of the equipment. Two thumb bolts and washers for attaching the strap to the cabinet are supplied. The washers are used as spacers to prevent marring the cabinet finish.



For best results a one-quarter wave length whip antenna approximately nine feet long, available in two mounting styles, should be used. The MI-555578 antenna is supplied with a bumper mount, which is normally clamped to the rear bumper. This is the most convenient mobile antenna to install because it does not require drilling any mounting holes in the automobile. A lead-in cable, 20 feet long, for connecting between the antenna and RADIO-PHONE, is supplied with the antenna. Also supplied with the antenna is a rain gutter clip that is used to hold the antenna down when not in use or when entering a garage.



The MI-555579 antenna, supplied with a swivel ball mounting, is designed to be mounted through any surface of the vehicle. A twenty foot lead-in cable and gutter clip is also supplied with this antenna.

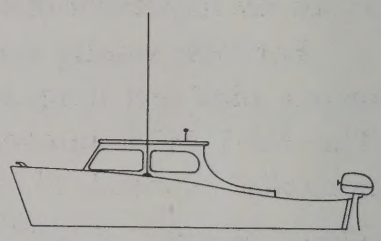
After the antenna is installed, plug the battery cable into the receptacle at the back of the RADIO-PHONE and connect the other end of the cable to the "hot" (ungrounded) terminal of the battery. It does not matter which polarity of the battery is grounded. Connect a wire between the ground terminal on the back of the set and some nearby metal part of the automobile. Scrape the paint if necessary.

Mount the microphone holder in a convenient location and plug the microphone into the receptacle in the lower right-hand corner of the front panel.

You may notice that there is more noise coming from the loudspeaker when the automobile engine is running. This is usually caused by electrical interference from the ignition system, or the generator, or both. If the interference is excessive it can be reduced by proper shielding, bonding and filtering of the vehicle's electrical system.

Generator interference can usually be reduced by connecting a .1 mfd coaxial capacitor (Sprague type 48P-9 or equivalent) in the *armature* lead. To install this type of capacitor, secure the capacitor to the generator case using the capacitor mounting hole. Disconnect the lead from the *armature* terminal of the generator and connect it to either end of the capacitor. Connect a short jumper wire between the other end of the capacitor and the *armature* terminal. *Do not* connect a capacitor to the field terminal as it would probably interfere with the proper operation of the voltage and current regulator.

MARINE INSTALLATION



For shipboard installation, the nine-foot stainless steel marine antenna (MI-555580) should be used. A twenty-foot lead-in cable is supplied with this antenna. When connecting the lead-in to the antenna, connect the center conductor of the cable to the antenna rod (center stud) and the cable shield to the stud on the metal mounting plate. On steel vessels, make sure there is a good electrical connection between the metal plate and the hull. On wooden vessels connect a short lead (not over three feet in length) between the metal plate and the nearest grounded object.

If there is no nearby ground point, it might be desirable to install a ground plate directly under the antenna. The ground plate consists of a copper sheet, at least five square feet in area, fastened to the vessel below the water line. Connect the metal plate on the antenna mounting to the ground plate through a .001 mfd (or larger value) mica or ceramic capacitor. On small craft using an outboard motor, the metal plate on the antenna mounting may be connected to the motor housing, provided the connecting wire is short.

Plug the battery cable into the receptacle at the back of the RADIOPHONE and connect the other end of the cable to the "hot" (ungrounded) terminal of the battery. Connect a wire between the ground terminal on the back of the equipment and the grounded battery terminal or engine frame. It doesn't matter which polarity of the battery is grounded.

Mount the microphone holder in a convenient location and plug the microphone into the receptacle in the lower right-hand corner of the front panel.

OPERATION

Read these instructions carefully and be especially careful in setting the SQUELCH control as outlined in Step 4 to obtain maximum performance from your RADIO-PHONE.

1. Turn on the RADIO-PHONE by rotating the VOLUME control knob clockwise.

2. Select one of the channels by means of the CHANNEL selector. Notice that there are eight positions on the CHANNEL selector marked 1,2,3,4 FIXED and 1,2,3,4 TUNEABLE. Selecting either channel 1 position will set the transmitter to the channel 1 frequency (see label on back of the equipment).

   When the selector is in the FIXED position, the receiver is crystal-controlled to receive the same frequency as transmitted. In the TUNEABLE position, you can tune the receiver to any Citizens' Band channel by means of the large tuning knob. The frequency in mega-cycles is indicated on the dial above the tuning knob.

   The equipment is shipped from the factory with crystals installed in channel 1 only. Therefore the other channels cannot be used until additional crystals are installed. See page 8 for ordering instructions.

3. Rotate the SQUELCH control knob fully clockwise.

4. Turn up the VOLUME until noise or a signal is heard. *The SQUELCH control must be set when only noise (no signal) is heard.* When only noise is present, turn the SQUECH control slowly counter-clockwise to the point where the noise just disappears. The receiver is now properly adjusted so that transmitted signals will be heard but the receiver will be quiet between transmissions. *Do not turn the SQUELCH control further than is necessary to just quiet the noise as this would result in weak signals being missed that might otherwise be heard.*

5. To transmit, slide the button on the side of the microphone toward the cable and hold it in that position. Talk directly into the end of the microphone. Release the button to receive. The equipment will not function as a receiver unless the button is released.

TUBE REPLACEMENT

If tube replacement becomes necessary, all tubes can be made accessible by removing the top cover. Remove the two screws on each side of the equipment and lift the cover off. Do not remove any other screws from the case as a shock hazard is present if the base is removed. The replacement tube must have the same type number as the original. A tube location diagram can be found on the bottom of the equipment and on page 17 of this book.

TECHNICAL SECTION

The following information is supplied for the use of a technician in servicing the equipment.

TYPICAL TUBE SOCKET VOLTAGES

Symbol, Tube Type and Function	*Type of Operation*	*Pin Numbers*								
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
V1 - 6AW8A	Receive	0	-77	220	H	H	0	-80	265	265
Crystal Oscillator/ R.F. Power Amplifier	Transmit	0	-6.6	105	H	H	0	-7.2	190	245
V2 - 6BA6	Receive	0	0	H	H	163	82	0.8	-	-
R.F. Amplifier	Transmit	-82	0	H	H	211	166	0.4	-	-
V3 - 6BE6	Receive	-3.2	0	H	H	158	66	0	-	-
Mixer - Oscillator	Transmit	-3.7	0	H	H	202	74	-6.1	-	-
V4 - 6BA6	Receive	0	0	H	H	187	90	1.0	-	-
First I.F. Amplifier	Transmit	-70	0	H	H	232	225	0	-	-
V5 - 6EA8	Receive	14	0	105	H	H	200	1.3	0	-0.9
Second I.F. Amplifier/ Microphone Amplifier	Transmit	14	-6.3	210	H	H	230	0.3	0	-0.9
V6 - 6T8	Receive	-1.0	-0.6	0.2	H	H	*-0.3 **-28	0	*-1.0 **-26	*60 **215
Noise Limiter - Detector-Squelch Clamp	Transmit	-11.0	-8.0	-5.2	H	H	*-0.2 **-0.3	0	-1.0	60
V7 - 6AQ5	Receive	0	11	H	H	250	218	0	-	-
Audio Output-Modulator	Transmit	0	11	H	H	250	235	0	-	-

* Squelch control maximum clockwise.

** Squelch control maximum counterclockwise.

Voltages measured to chassis with VTVM (RCA VoltOhmyst or equivalent) and are positive except where noted.

Transmitter tuned and loaded, with no signal input to receiver.

TECHNICAL SUMMARY

Electrical

Frequency Range ..... 26.965–27.255 mc

Transmitter Frequency

6 VDC/115 VAC Models	*12 VDC/115 VAC Models*	*Channel 1 Freq.**
MI-555565-1	MI-555566-1	26.975 mc
MI-555565-2	MI-555566-2	27.005 mc
MI-555565-3	MI-555566-3	27.035 mc
MI-555565-4	MI-555566-4	27.215 mc

Transmitter Power** ..... 5 watts

Receiver Audio Power Output ..... 2 watts

Receiver Sensitivity (6 db signal-to-noise ration) .... 1 microvolt

Power Drain

Supply Voltage	*Receive*	*Transmit*	*Batt. Cable Fuse*
6.3 volts DC	7.4 amp	9.0 amp	10 amp
12.6 volts DC	3.7 amp	4.5 amp	5 amp
115 volts AC 60 cycle	47 watts	48 watts	—

Mechanical

Height ..... 5½ inches

Width ..... 12 inches

Depth ..... 8 inches

Weight (Less accessories) ..... 12½ pounds

Shipping Weight ..... 15½ pounds

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* Crystals installed in channel 1 only. Other channels cannot be used until additional crystals are installed. (See page 8).

** Plate input power to final radio frequency stage.

Tube Complement

1 RCA 6AW8A Crystal Oscillator/Power Amplifier
1 RCA 6BA6 RF Amplifier
1 RCA 6BE6 Mixer-Oscillator
1 RCA 6BA6 IF Amplifier
1 RCA 6EA8 IF Amplifier/Microphone Amplifier
1 RCA 6T8 Noise Limiter, Detector, Squelch Clamp, Audio Amplifier
1 RCA 6AQ5 Audio Output/Modulator

Pilot Lamp

1 Mazda #47

ADDING NEW FREQUENCIES

IMPORTANT: Use only crystals listed in the table. The use of any other type of crystal may result in illegal (off-frequency) operation. Transmitting crystals must be installed and checked by a person holding a first or second class commercial operator's license.

The Mark VII RADIO-PHONE is shipped from the factory with one pair of crystals installed in channel 1. If additional frequencies are required, order the desired crystals from your dealer by specifying the RCA part number listed in the table. Normally a transmitting and receiving crystal for a new channel are installed at the same time. However, a transmitting crystal may be added and the receiver tuned to the new frequency by means of the tuning dial, with the CHANNEL selector in the TUNEABLE position.

The table lists the crystals that are available for the Mark VII RADIO-PHONE. The actual crystal frequency is stamped on the crystal case. This frequency is the same as the channel frequency for transmitting crystals and 1.65 mc higher than the channel frequency for the receiving crystals. These transmitting crystals are stamped with the letter "T" and the receiver crystals are stamped with the letter "R". Be sure they are plugged into the correct sockets.

CIRCUIT DESCRIPTION

Receiver: The receiver is a superheterodyne type with an intermediate frequency of 1650 Kc. The transmitter power amplifier tank circuit (T2 and C11) also serves as the input tuned circuit for the receiver. The signal is coupled to the grid of the RF amplifier (V2) by means of a small capacitor (C13).

MARK VII RADIO-PHONE TRANSMITTING AND RECEIVING CRYSTALS

Channel Frequency (mc)	*Transmitter Crystals*			*Receiver Crystals*		
	*RCA Part No.**	*Frequency (mc)*	*Marking*	*RCA Part No.**	*Frequency (mc)*	*Marking*
26.965	MI-555582-1	26.965	019-002361-1	MI-555583-1	28.615	019-002362-1
26.975	MI-555582-2	26.975	019-002361-2	MI-555583-2	28.625	019-002362-2
26.985	MI-555582-3	26.985	019-002361-3	MI-555583-3	28.635	019-002362-3
27.005	MI-555582-4	27.005	019-002361-4	MI-555583-4	28.655	019-002362-4
27.015	MI-555582-5	27.015	019-002361-5	MI-555583-5	28.665	019-002362-5
27.025	MI-555582-6	27.025	019-002361-6	MI-555583-6	28.675	019-002362-6
27.035	MI-555582-7	27.035	019-002361-7	MI-555583-7	28.685	019-002362-7
27.055	MI-555582-8	27.055	019-002361-8	MI-555583-8	28.705	019-002362-8
27.065	MI-555582-9	27.065	019-002361-9	MI-555583-9	28.715	019-002362-9
27.075	MI-555582-10	27.075	019-002361-10	MI-555583-10	28.725	019-002362-10
27.085	MI-555582-11	27.085	019-002361-11	MI-555583-11	28.735	019-002362-11
27.105	MI-555582-12	27.105	019-002361-12	MI-555583-12	28.755	019-002362-12
27.115	MI-555582-13	27.115	019-002361-13	MI-555583-13	28.765	019-002362-13
27.125	MI-555582-14	27.125	019-002361-14	MI-555583-14	28.775	019-002362-14
27.135	MI-555582-15	27.135	019-002361-15	MI-555583-15	28.785	019-002362-15
27.155	MI-555582-16	27.155	019-002361-16	MI-555583-16	28.805	019-002362-16
27.165	MI-555582-17	27.165	019-002361-17	MI-555583-17	28.815	019-002362-17
27.175	MI-555582-18	27.175	019-002361-18	MI-555583-18	28.825	019-002362-18
27.185	MI-555582-19	27.185	019-002361-19	MI-555583-19	28.835	019-002362-19
27.205	MI-555582-20	27.205	019-002361-20	MI-555583-20	28.855	019-002362-20
27.215	MI-555582-21	27.215	019-002361-21	MI-555583-21	28.865	019-002362-21
27.225	MI-555582-22	27.225	019-002361-22	MI-555583-22	28.875	019-002362-22
27.255	MI-555582-23	27.255	019-002361-23	MI-555583-23	28.905	019-002362-23

* Specify this RCA Part No. when ordering crystals.

The plate of the RF amplifier is coupled by a double-tuned over-coupled circuit to grid #3 of a pentagrid converter (V3) The oscillator portion of the converter is either crystal controlled or tuneable, depending upon the position of the channel selector switch (S1). The converter is followed by a two stage IF amplifier (V4 and V5A). The signal is detected by a diode detector (part of V6).

One diode section of V6 is used as a series type noise limiter. This diode is normally biased for conduction permitting the signal to pass through it. A noise pulse momentarily biases the diode off by applying a negative voltage, caused by the rectified noise pulse, to the plate. The cathode supply voltage remains constant during a noise pulse because of the time constant provided by R25 and C38.

The detected audio signal is amplified by the triode section of V6 and power amplifier V7. The grid of the triode section of V6 is controlled by the squelch circuit which operates as follows:

The grid return of V6 triode is connected to the arm of the squelch control potentiometer. This potentiometer is part of a voltage divider between the first IF amplifier screen grid and the negative supply. The squelch control is set to just cut the triode off with no input signal.

When a signal is received, the AGC voltage applied to the first IF amplifier reduces the screen grid current causing the screen voltage to rise. This causes the grid voltage of the audio amplifier to rise, bringing it out of cut-off. The grid voltage is prevented from going positive by a diode clamp (part of V6). The amplifier operates with contact potential bias.

Transmitter: The crystal oscillator (triode section of V1) is crystal controlled by a third overtone crystal. The setting of the oscillator plate inductor adjustment screw T1 affects the transmitter frequency. The factory setting must not be changed except by a properly licensed operator who has equipment capable of accurately measuring the output frequency. The oscillator is coupled to the grid of the power amplifier (pentode section of V1) by capacitor C5. The power amplifier tank circuit (T2 and C11) is inductively coupled to the antenna. A link between T2 and T1 provides neutralization of the power amplifier.

The output of the ceramic microphone is amplified by V5B and the triode section of V6. The receiver audio power amplifier (V7) also serves as the transmitter modulator. The RF power amplifier is plate and screen modulated.

Transmit-Receive Switching: The transmit-receive relay K1 is energized by the microphone slide-button S401. One contact section of this relay transfers the grid circuit of the audio amplifier section (V6) from

the receiver detector output to the output of the transmitter microphone amplifier, V5B. The other section of K1, when energized, opens the receiver speaker circuit and removes a blocking bias from the transmitter oscillator and power amplifier.

Power Supply: The power supply operates from 115V AC or a DC battery voltage. When using a battery the tube heaters are connected directly across the battery. For AC operation the heaters are connected to the vibrator winding of the power transformer (T6). The high voltage is supplied by a voltage doubler using selenium rectifiers CR2 and CR3. The negative bias supply uses CR1.

RECEIVER ALIGNMENT

One of the most accurate methods for aligning the receiver is to use a second RADIO-PHONE as a signal source. Both RADIO-PHONES must be set-up for the same frequency. Set the CHANNEL selector of the equipment to be aligned to FIXED tuned position of the appropriate channel.

Measure the receiver AGC voltage with a vacuum tube voltmeter (RCA Voltohmyst or equivalent).

Couple enough signal from the "signal source" RADIO-PHONE to produce an AGC voltage of approximately one volt.

Adjust the tuning slugs on the top and bottom of each of the three IF transformers (T3, T4 and T5 — see Figures 2 and 3) for maximum AGC voltage. If necessary, change the coupling from the "signal source" RADIO-PHONE transmitter to keep the AGC voltage under two volts.

Because of the interaction between the primary and secondary of the RF amplifier plate transformer (T8) a swamping resistor and capacitor (100 ohm resistor in series with a .005 mfd capacitor) must be used.

Connect the swamping resistor and capacitor across the secondary of T8. Readjust the coupling from the "signal source" RADIO-PHONE to produce an AGC voltage of approximately one volt. Adjust the bottom tuning slug of T8 (see Figure 3) for maximum AGC voltage.

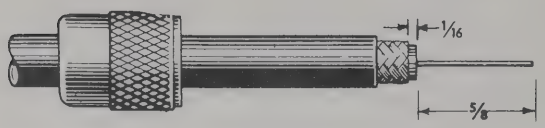
Connect the swamping resistor and capacitor across the primary of T8 and adjust the upper slug of T8 (see Figure 2) for maximum AGC.

The receiver alignment is now complete. Do not change the adjustment of T2 in the input circuit as this is factory set for proper operation of the transmitter.

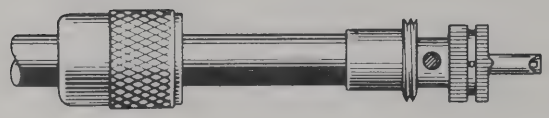
If a second RADIO-PHONE is not available, an *accurately calibrated* signal generator can be used. Set the signal generator frequency to *exactly* 1650 KC for the IF alignment and set it for maximum AGC voltage at the RF frequency for the alignment of T8.

USING RG-8/U CABLE WITH PL-259 UHF CONNECTOR

Cut end of cable even. Remove vinyl jacket 1⅛".



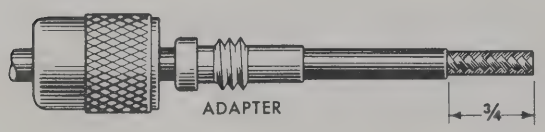
Bare ⅝" of center conductor. Trim braided shield. Slide coupling ring on cable. Tin exposed center conductor and braid.



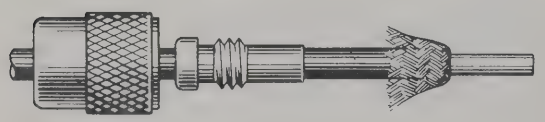
Screw the plug sub-assembly on cable. Solder assembly to braid through solder holes. Use enough heat to create bond of braid to shell. Solder center conductor to contact.

For final assembly, screw coupling ring on plug sub-assembly.

USING RG-58/U CABLE WITH PL-259 CONNECTOR AND UG-175/U ADAPTER

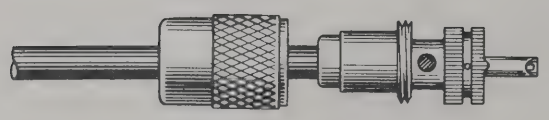


Cut end of cable even. Remove vinyl jacket ¾". Slide coupling ring and adapter on cable.



Fan braid slightly and fold back as shown.

Position adapter to dimension shown. Press braid down over body of adapter and trim to ⅜". Bare ⅝" of conductor. Tin exposed center conductor.



Screw plug sub-assembly on adapter. Solder braid to shell through solder holes. Use enough heat to create bond of braid to shell. Solder conductor to contact.

For final assembly, screw coupling ring on plug sub-assembly.

Figure 1. Antenna Lead-in Cable Connector Assembly

MARK VII RADIO-PHONE CRM-P3A-5
LIST OF PARTS

Symbol No.	*Stock No.*	*Description*
		6 V MI-555565, 12V MI-555566
		Capacitors
C1	219998	mica, 190 μμf ±2%, 500 v
C2		mica, 470 μμf ±2%, 300 v (Arco Type DM-15)
C3		ceramic, disc, 1000 μμf GMV, 500 v
C4		ceramic, tubular, 5 μμf ±0.5 μμf N750, 500 v
C5		ceramic, tubular, 5 μμf ±0.5 μμf N750, 500 v
C6		ceramic, disc, 1000 μμf GMV, 500 v
C7		paper, molded tubular, 0.02 μf ±20%, 400 v
C8		ceramic, disc, 1000 μμf GMV, 500 v
C9		ceramic, disc, 1000 μμf GMV, 500 v
C10		ceramic, disc, 1000 μμf ±20%, 1000 v
C11		ceramic, tubular, 5 μμf ±0.5 μμf N750, 500 v
C12	204940	mica, 24 μμf ±2%, 500 v
C13		ceramic, tubular, 10 μμf ±0.5 μμf N750, 500 v
C14		ceramic, disc, 1000 μμf GMV, 500 v
C15		ceramic, disc, 1000 μμf GMV, 500 v
C16		ceramic, disc, 1000 μμf GMV, 500 v
C17		mica, 10 μμf ±20%, 500 v char. "C"
C18	219975	variable, ceramic, 1.5-10 μμf
C19	219974	variable, air., 2.5-6.0 μμf
C20	219999	mica, 71 μμf ±2%, 500 v
C21		mica, 50 μμf ±2%, 500 v (Arco Type DM-15)
C22		ceramic, tubular, 15 μμf ±5%, N750, 500 v
C23		ceramic, tubular, 22 μμf ±10%, N750, 500 v
C24		ceramic, disc, 0.02 μf +80% -20%, 500 v
C25		ceramic, tubular, 22 μμf ±10%, N750, 500 v
C26 to C32		ceramic, disc, 0.01 μf +80% -20%, 500 v
C33		ceramic, disc, 5000 μμf GMV, 500 v
C34		ceramic, disc, 0.01 μf +80% -20%, 500 v
C35, C36		ceramic, tubular, 100 μμf ±20%, N750, 500 v
C37		ceramic, disc, 1000 μμf GMV, 500 v
C38, C39		paper, molded tubular, 0.1 μf ±20%, 200 v
C40		paper, molded tubular, 0.1 μf ±20%, 400 v
C41, C42		ceramic, disc, 0.01 μf +80% -20%, 500 v
C43		ceramic, disc, 0.1 μf +80% -20%, 50 v
C44, C45		ceramic, disc, 0.01 μf ±20%, 500 v
C46		paper, molded tubular, 0.22 μf ±20%, 600 v
C47	219977	electrolytic, 40 μf 200 v
C48	219976	electrolytic, 40/40/40/10 μf 350/350/200/50 v
C49, C50		40 μf 350 v, part of C48
C51, C52		ceramic, disc, 0.001 μf GMV, 1400 v
C53		paper, molded tubular, 0.003 μf ±20%, 600 v
C54		ceramic, disc, 1000 μμf GMV, 500 v
C55		ceramic, disc, 0.02 μf +80% -20%, 500 v
C56		ceramic, tubular, 100 μμf ±20%, N750, 500 v
C57		ceramic, disc, 1000 μμf GMV, 500 v
C58		10 μf 50 v (part of C48)
C59		ceramic, disc, 2000 μμf ±20%, 500 v
C60		paper, molded tubular, 0.002 μf ±20%, 600 v
C61		ceramic, disc, .1 μf +80%, -20%, 400 v
C62		ceramic, disc, 1000 μμf GMV, 500 v
C63		paper, molded, tubular, 0.001 μf ±20%, 600 v
C64		ceramic, disc, 1000 μμf GMV, 500 v
C65		ceramic, disc, 0.01 μf +80% -20%, 500 v
C66		ceramic, tubular, 100 μμf ±20%, N750, 500 v

LIST OF PARTS (Cont.)

Symbol No.	*Stock No.*	*Description*
C67		ceramic, tubular, 10 μμf ±0.5 μμf N750, 500 v
C68		ceramic, tubular, 12 μμf ±0.5 μμf N750, 500 v
C69 to C200		Not Used
C201		ceramic, disc, 0.01 μf ±20%, 500 v
C301		ceramic, disc, 0.01 μf ±20%, 500 v
CR1	218022	Rectifier: selenium
CR2, CR3	219973	Rectifier: silicon diode
CR4		Germanium diode (IN128)
DS201		Lamp: min. bay., 6-8 v, 0.15 amp. dark green (Type 47)
DS301		Lamp: min., bay., 6.8 v, 0.15 amp., dark green (Type 47)
F1		Fuse: cartridge, 10 amp., 32 v std. (For MI-555565, 6 v)
F1		Fuse: cartridge, 5 amp., 32 v std. (MI-555566, 12 v)
G1	220000	Vibrator: non-synchronous, 6 v, 115 CPS (MI-555565 only)
G1	220001	Vibrator: non-synchronous, 12 v, 115 CPS (MI-555566 only)
J1	58569	Connector: female, coaxial, chassis mtg.
J2		Connector: male, 8 contact, chassis mtg. (Cinch Jones #P-308-DB)
K1	219969	Relay: 6 v, 60 cy., contacts D.P.D.T. (MI-555565 only)
K1	219970	Relay: 12 v, 60 cy., contacts D.P.D.T. (MI-555566 only)
L1, L2	219988	Reactor: R.F. Choke, 500 microhenry
L3	219989	Coil: R.F. 54 MC trap, less tuning core
L4	219985	Coil: oscillator (Receiver)
L5	219983	Reactor: R.F. Choke, 7.2 microhenry
L6	219982	Reactor: filter, 30 microhenry, vibrator hash
L7	219984	Coil: vibrator Hash Suppressor, 0.03 microhenry
LS1	79696-B	Speaker: 4" PM, 3.2 ohm voice coil
P1		Not Used
P2, P3		Connector: female, 8 contact, cable mtg. (AC & DC Cables) (Cinch Jones S-308-CCT)
		RESISTORS: Fixed, Composition - Unless Otherwise Specified
R1		47,000 ohm, ±10%, ½ w
R2		56,000 ohm, ±10%, ½ w
R3		47,000 ohm, ±10%, ½ w
R4		27,000 ohm, ±10%, ½ w
R5		56 ohm, ±10%, ½ w
R6		8200 ohm, ±5%, 1 w
R7		470,000 ohm, ±10%, ½ w
R8		68 ohm, ±10%, ½ w
R9		27,000 ohm, ±10%, 1 W
R10		4700 ohm, ±10%, 1 w
R11, R12		47,000 ohm, ±10%, ½ w
R13		39,000 ohm, ±10%, ½ w
R14, R15		47,000 ohm, ±10%, ½ w
R16		68 ohm, ±10%, ½ w
R17		27,000 ohm, ±10%, ½ w
R18		2200 ohm, ±10%, ½ w
R19		10 meg ±10%, ½ w
R20		150 ohm, ±10%, ½ w
R21		47,000 ohm, ±10%, ½ w
R22		2200 ohm, ±10%, ½ w
R23		47,000 ohm, ±10%, ½ w

LIST OF PARTS (Cont.)

Symbol No.	*Stock No.*	*Description*
R24		2.2 meg. ±10%, ½ w
R25		470,000 ohm, ±10%, ½ w
R26		1 meg. ±10%, ½ w
R27, R28		220,000 ohm, ±10%, ½ w
R29		wire wound, 5 ohm, ±10%, 5 w (MI-555565, 6 v only) (I.R.C. Type PW 5)
R29		22 ohm, ±10%, 2 w (MI-555566, 12 v only)
R30		1 meg. ±10%, ½ w
R31		560,000 ohm, ±10%, ½ w
R32		10 ohm, ±10%, ½ w
R33		470,000 ohm, ±10%, ½ w
R34		100 ohm, ±10%, 1 w
R35		1000 ohm, ±10%, 2 w
R36		10 meg. ±10%, ½ w
R37		2.2 meg. ±10%, ½ w
R38		220,000 ohm, ±10%, ½ w
R39		10,000 ohm, ±10%, ½ w
R40		330 ohm, ±10%, 1 w
R41		470,000 ohm, ±10%, ½ w
R42		1.5 meg. ±10%, ½ w
R43	219972	variable, comp.. 3 meg. ±30%, ¼ w (Squelch)
R44		1.5 meg ±10%, ½ w
R45		56,000 ohm, ±10%, ½ w
R46		22,000 ohm, ±10%, ½ w
R47		56,000 ohm, ±10%, ½ w
R48	219971	variable, comp., 2 meg. ±30%, 1/8 w with S.P.S.T. switch (volume)
R49		1.8 meg. ±10%, ½ w
R50		8.2 meg ±10%, ½ w
R51		470,000 ohm, ±10%, ½ w
R52		1 meg. ±10%, ½ w
R53		100.000 ohm, ±10%, ½ w
R54 to R200		27,000 ohm, ±10% ½ W
R201		39 ohm, +10%, 2 W
R55 to R200		Not Used
S1A, B	219991	Switch: rotary, wafer, 2 section, 8 position with detent assy.
S1C	219992	Switch: rotary wafer, single section, 8 position, wafer only less detent
S2		Part of R48
SO1		Connector: female, 5 contact, chassis mtg. microphone input (Amphenol 78-S5S)
T1	219981	Transformer: oscillator (transmitter) less tuning core
T2	219980	Coil: R.F., P.A. tank, less tuning core
T3 to T5	219978	Transformer: I.F. 1650 KC
T6	219986	Transformer: power, (MI-555565, 6 v only)
T6	219987	Transformer: power, (MI-555566, 12 v only)
T7	219990	Transformer: A.F. output and modulation
T8	220251	Transformer: R.F. double tuned, plate
XG1		Socket: vibrator, 4 contact (Cinch Jones #X154)
XV1		Socket: tube, 9 pin min., shield type (Cinch Mfg. Co. #12625)
XV2		Socket: tube, 7 pin min., plain type (Cinch Mfg. Co. #16040)
XV3		Socket: tube; 7 pin min., mica filled (Cinch Mfg. Co. #16041)

LIST OF PARTS (Cont.)

Symbol No.	*Stock No.*	*Description*
XV4		Socket: tube, 7 pin min., plain type (Cinch Mfg. Co. #16040
XV5, XV6		Socket: tube, 9 pin min., plain type (Cinch Mfg. Co. #13475)
XV7		Socket: tube, 7 pin min., plain type (Cinch Mfg. Co. #16040)
XY1, XY2	79970	Socket: crystal, 2 contact steatite
		Miscellaneous:
		Cable: power, 2 conductors, plastic covered with molded on 2 contact male A.C. connector
	219993	Core: tuning, iron (for T1, T2 & L3)
	104516	Foot: rubber cabinet bottom (pkg. of 4)
	216370	Foot: rubber, for handle (pkg. of 4)
		Holder: fuse, in-line type (General Cement #1749)
	219995	Indicator: transparent vinyl dial scale
	219967	Knob: round, aluminum, knob & stud assy. (handle retaining)
	219966	Knob: round, black phenolic (main tuning)
	219968	Knob: round, black phenolic (squelch)
	219968	Knob: round, black phenolic with white line, (volume & channel)
	219994	Microphone: ceramic, complete with 48" cable & 5 contact male connector
	219996	Scale: translucent vinyl, tuning dial
		Shield: tube, 9 pin min., (for V1) (Cinch Mfg. Co. #12626)
		Shield: tube, 9 pin min., (for V5) (Cinch Mfg. Co. #13979)
	219997	Socket: lamp (for DS-201 & DS-301)
	219965	Terminal: female, single, push on type connector, for #18-22 wire

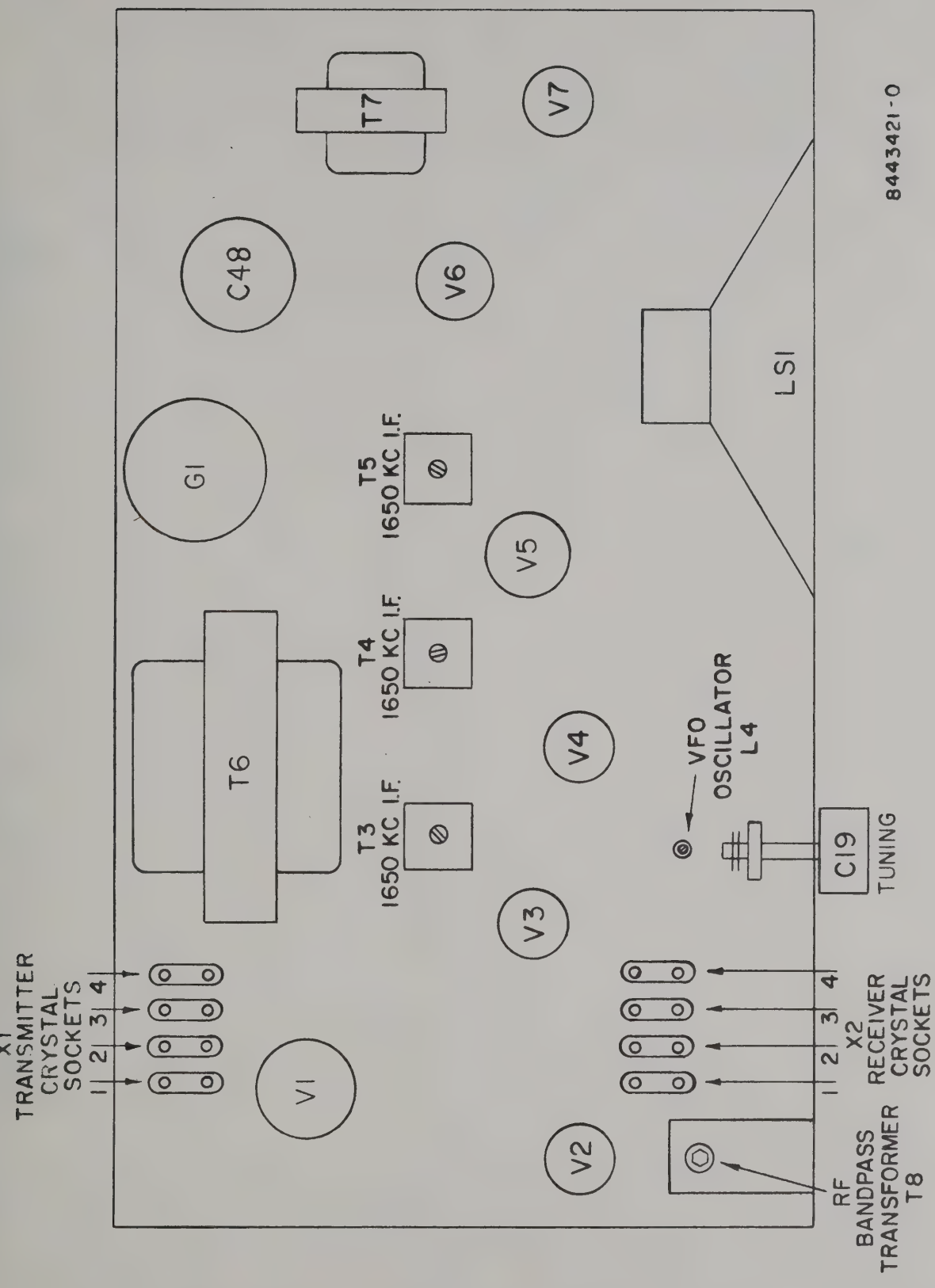


Figure 2. Location of Tubes and Components, Top of Chassis

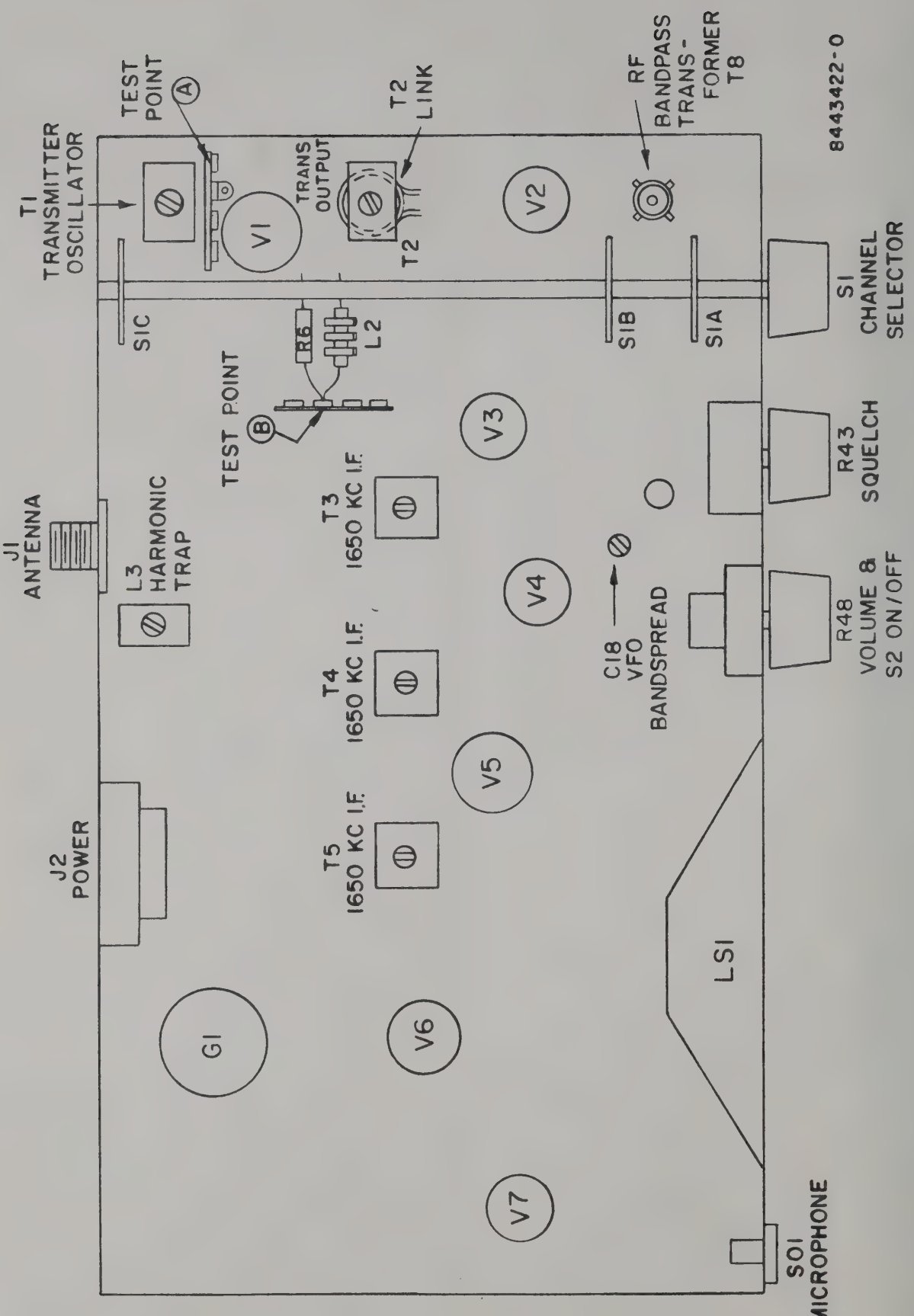
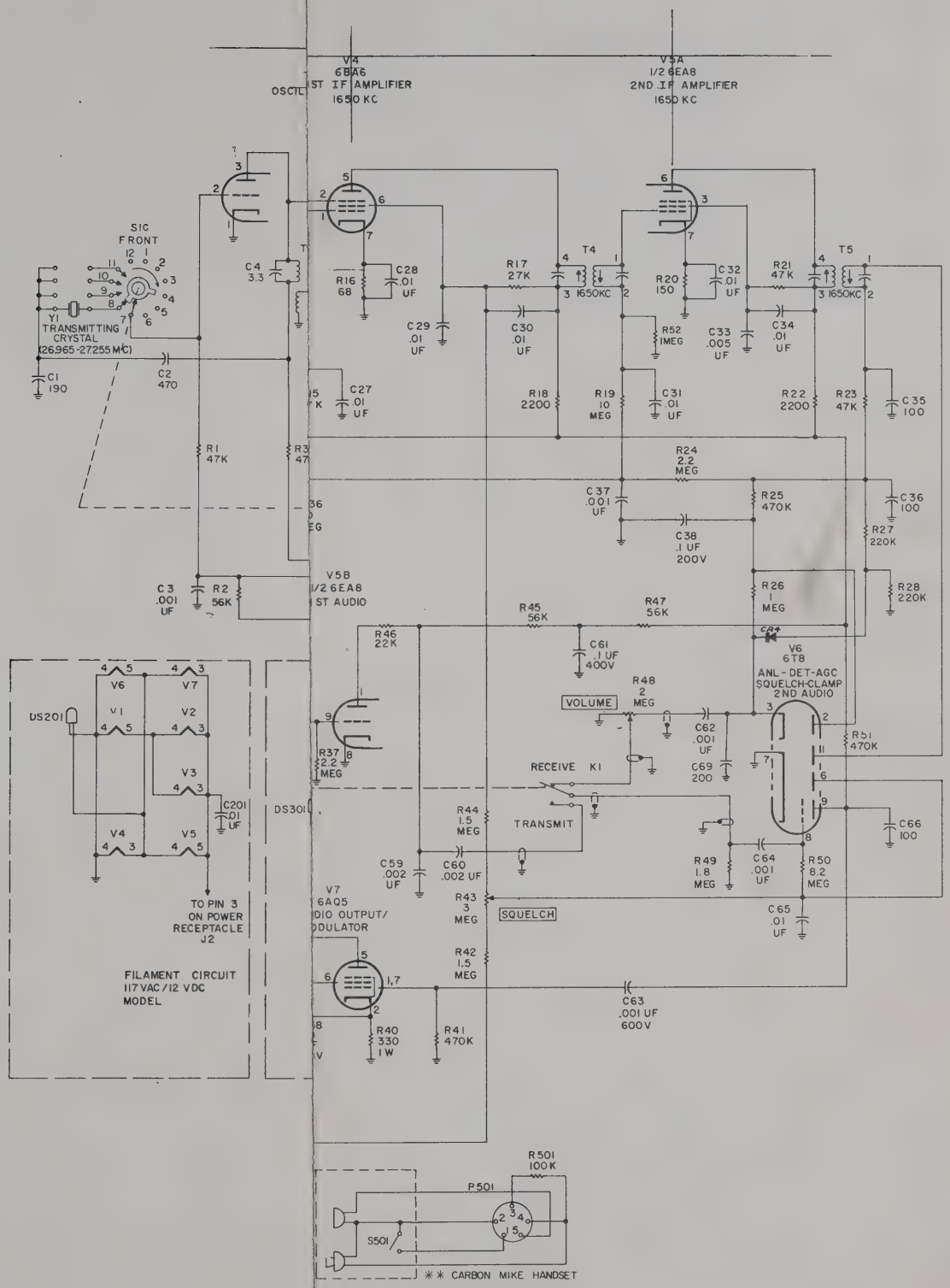


Figure 3. Location of Tubes and Components, Bottom of Chassis



ure 4. Schematic Diagram, Mark VII Radio-Phone

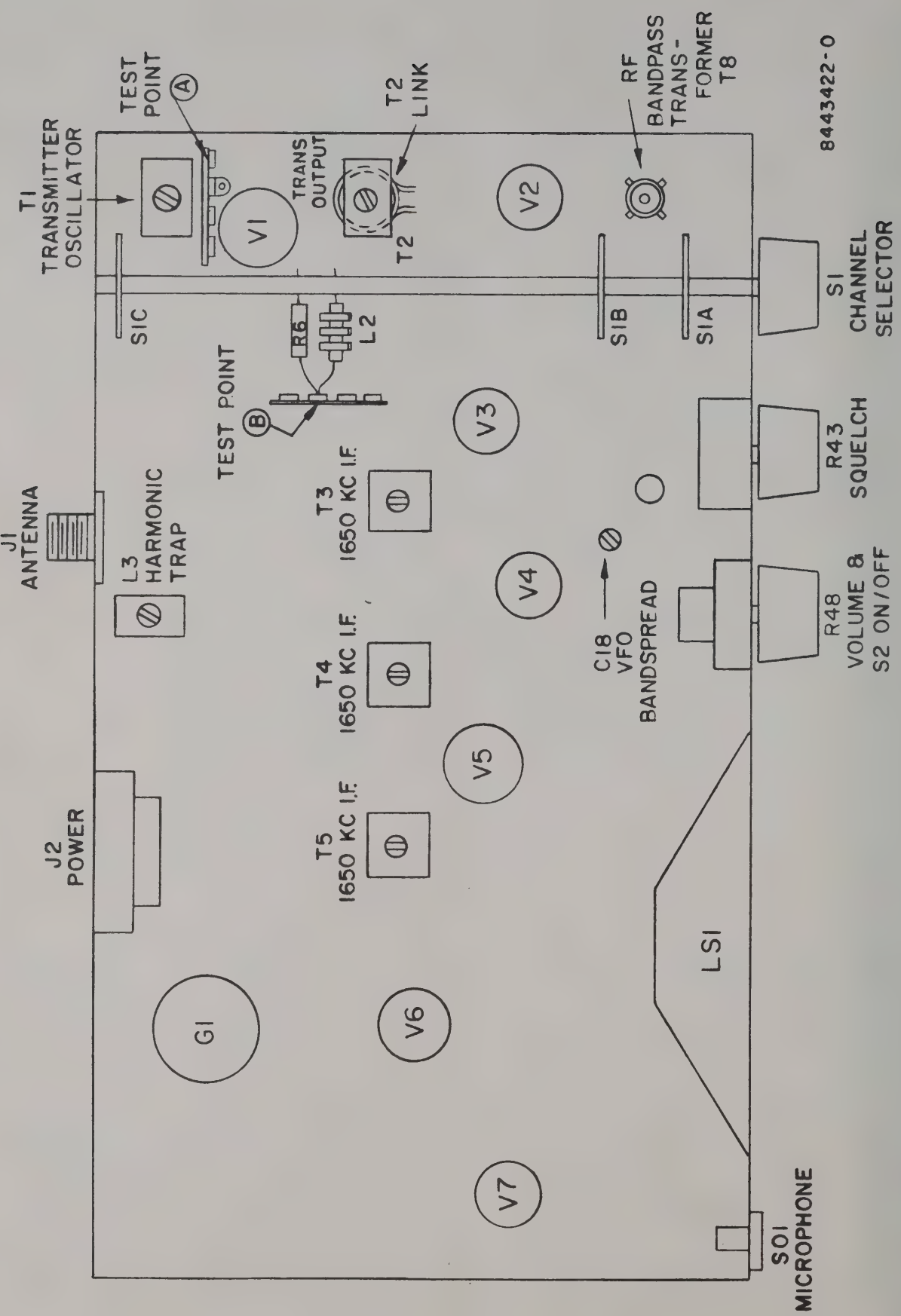
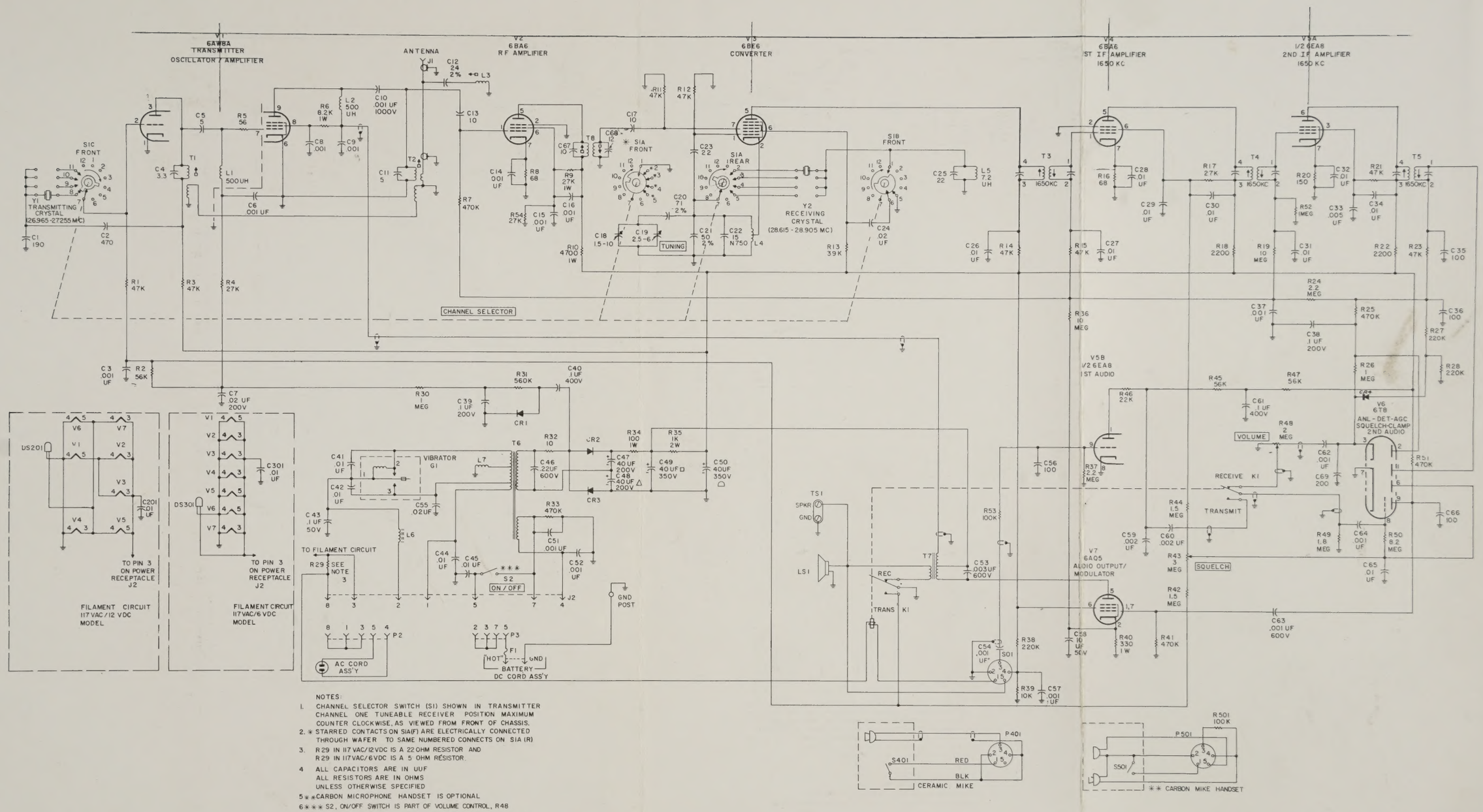


Figure 3. Location of Tubes and Components, Bottom of Chassis



NOTES:

1. CHANNEL SELECTOR SWITCH (S1) SHOWN IN TRANSMITTER CHANNEL ONE TUNEABLE RECEIVER POSITION MAXIMUM COUNTER CLOCKWISE, AS VIEWED FROM FRONT OF CHASSIS.
2. * STARRED CONTACTS ON S1A(F) ARE ELECTRICALLY CONNECTED THROUGH WAFER TO SAME NUMBERED CONNECTS ON S1A (R)
3. R29 IN 117 VAC/12 VDC IS A 22 OHM RESISTOR AND R29 IN 117 VAC/6 VDC IS A 5 OHM RESISTOR.
4. ALL CAPACITORS ARE IN UUF
   ALL RESISTORS ARE IN OHMS
   UNLESS OTHERWISE SPECIFIED
5. ** CARBON MICROPHONE HANDSET IS OPTIONAL
6. *** S2, ON/OFF SWITCH IS PART OF VOLUME CONTROL, R48

Figure 4. Schematic Diagram, Mark VII Radio-Phone

RCA